The thermoelectric pyrheliometer was standardized by comparisons with a Marvin pyrheliometer in Washington during the earlier part of September, and with Smithsonian silver disk pyrheliometer No. 1 in Chicago on October 9, 10, and 11. The factor found to reduce scale readings on the record to gram-calories per minute per square centimeter is 0.087.

It is worthy of note that while the highest intensity of solar radiation at normal incidence measured at Chicago was 1.20 gram-calories, with an air mass of 1.5, the highest intensities measured at Madison and Lincoln in this same month, and with a greater air mass of about 1.8, were 1.38 and 1.48 gram-calories, respectively.

In this connection it is of interest to recall a decrease in solar radiation intensity from 1.43 calories to 1.17 calories at Lincoln, due to a smoke cloud that was brought over the university farm from the city by a change in wind direction. See this REVIEW for January, 1917, 45:4.

TABLE 1.—*Solar radiation intensities during October, 1923.*

[Gram-calories per minute per square centimeter of normal surface.]

Washington, D. C.

Date.	Sun's zenith distance.										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th mer. time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Oct. 1	6.50	0.80							0.87	0.75	6.50
2	7.87			1.02	1.15						8.18
3	7.29			0.71	0.95	1.31	0.86	0.72	0.52	0.40	7.57
4	9.14		0.59	0.68	0.76						7.04
5	4.57	0.95	1.06	1.17	1.30	1.49	1.23	1.06	0.90	0.77	4.17
6	5.36			0.75	1.03						3.99
8	5.56	0.73	0.85	1.01	1.19	1.43	1.26	1.07	0.91	0.79	4.95
9	5.36		0.86	1.01	1.19		1.09	0.93	0.78	0.66	4.37
17	7.87		0.77	0.94	1.08	1.29	1.11	0.95	0.79	0.70	6.76
18	6.50	0.70	0.80	0.91	1.14		1.26	1.04	0.87	0.80	7.04
20	7.04						1.06	0.78	0.54		5.16
22	4.37			1.01	1.21	1.39					4.95
25	5.56				1.13						6.02
26	6.50						1.18	1.03	0.84	0.70	6.27
27	5.16						1.26	1.07	0.96		3.45
29	8.81				0.83						9.47
31	4.75						0.96	0.75	0.62	0.50	3.99
Means		0.80	0.82	0.92	1.08	1.48	1.13	0.94	0.78	0.67	
Departures		+0.04	±0.00	±0.00	−0.01		+0.02	+0.03	+0.01	−0.01	

TABLE 1.—*Solar radiation intensities during October, 1923*—Continued.

Madison, Wis.

Date.	Sun's zenith distance.										
	8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th mer. time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Oct. 2	8.18						1.12				8.48
14	4.57			1.08							5.79
15	5.16		0.88	1.06	1.27	1.51					5.56
19	3.99		1.09	1.19							5.36
22	3.63				1.14		1.27	0.97			3.99
23	5.79							0.76			4.57
24	6.27				1.26						5.16
30	2.36			1.26	1.39						3.30
31	3.15			1.17	1.36	1.57	1.37	1.17			3.00
Means			(0.98)	1.15	1.28	(1.54)	1.25	0.94			
Departures			+0.07	+0.09	+0.10		+0.07	−0.07			

Lincoln, Nebr.

Oct. 17	10.59		0.95		1.25		1.29				7.29
18	5.16					1.49	1.34	1.21	1.08	0.98	3.63
20	3.63		1.09	1.22	1.39	1.53	1.37	1.21	1.09	0.98	2.87
22	3.45		1.04	1.17	1.31	1.47	1.28	1.12	0.99	0.85	4.17
23	3.99	0.89	0.99	1.11	1.29	1.50	1.27	1.09	0.95	0.83	4.95
30	2.62			1.30	1.44	1.60	1.45	1.24	1.16	1.05	2.87
31	2.87	0.97	1.11	1.26	1.44	1.58	1.31	1.05			3.30
Means		(0.93)	1.04	1.21	1.35	1.53	1.33	1.15	1.05	0.94	
Departures		+0.03	+0.07	+0.10	+0.07		+0.07	+0.07	+0.11	+0.11	

* Extrapolated.

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*

Week beginning.	Average daily radiation.				Average daily departure for the week.			Excess or deficiency since first of year.		
	Chicago.	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
Oct. 1	254	396	323	297	+69	−49	−56	−3,823	−665	−3,050
8	266	333	252	320	+25	−2	−4	−3,645	−677	−3,077
15	147	247	176	320	−40	−49	+28	−3,922	−1,023	−2,881
22	177	198	169	266	−67	−35	+5	−4,394	−1,270	−2,847
29	156	249	217	241	+2	+31	−2	−4,382	−1,054	−2,860

WEATHER OF NORTH AMERICA AND ADJACENT OCEANS.

NORTH ATLANTIC OCEAN.

By F. A. YOUNG.

The average pressure for the month varied considerably, as compared with the normal, at a number of land stations on the coast and islands of the North Atlantic, as shown by the following figures:

The barometric readings are in inches, made at 8 a. m., 75th meridian time, and the departures are approximate, as the normals were taken from the Pilot Chart.

St. Johns, Newfoundland, mean 30.04, departure +0.11. Nantucket, 30.08, +0.05. Hatteras, 30.09, +0.05. Key West, 29.96, −0.01. New Orleans, 30.03, +0.02. Swan Island, 29.82, −0.09. Turks Island, 29.97, +0.02. Bermuda, 30.06, +0.01. Horta, Azores, 30.12, +0.01. Lerwick, Shetland Islands, 29.35, −0.43. Valentia, Ireland, 29.72, −0.19. London, 29.73, −0.18.

It can be seen from these figures that while the average pressure was practically normal in the Azores and Bermudas, it was very much below in northern Europe. The Icelandic LOW was unusually deep, causing turbulent conditions along the European coast, north of the 50th parallel.

Taking the ocean as a whole, October was an unusually stormy month. There were a number of disturbances of tropical origin, that are described elsewhere in the REVIEW, and the eastern section was swept by one gale after another, while along the American coast the number of days with heavy winds was also above the normal.

Fog was unusually prevalent over the Grand Banks, where it was observed on from 14 to 15 days during the month. According to reports received the number of days on which it occurred over the remainder of the ocean did not differ materially from the normal as shown on the Pilot Chart.

Charts VIII and IX give the conditions on the 1st and 2d, respectively, with the location of the disturbance

that was first reported in the vicinity of the Bahamas on September 25, the track being shown by Charts VIII to XII for that month. The following storm logs give an idea of its intensity after reaching northern waters:

Dutch S. S. *Mijdrecht:*

Gale began on September 30, wind SW. Lowest barometer 29.19 inches on the 1st, wind S., 12, in latitude 40° 20′ N., longitude 58° 48′ W. End on the 2d, wind W. Highest force of wind 12, SW.; shifts SW.–S.

British cable S. S. *Faraday:*

Gale began on September 30, wind ENE. Lowest barometer 28.86 inches at 8 p. m. on the 1st, wind NE., in latitude 45° 33′ N., longitude 61° 13′ W. End on the 2d, wind NW. Highest force of wind 10, WNW.; shifts NE.–NNE.

On the 3d and 4th an area of low pressure covered the North Sea and on the former date northerly to westerly gales prevailed off the British coast. Storm log:

British S. S. *Demerara:*

Gale began on the 3d, wind N. Lowest barometer 30.08 inches at noon on the 3d, wind N., 7, in latitude 35° 17′ N., longitude 11° 35′ W. End on the 4th, wind N. Highest force of wind 8; shifts NNW.–N.

From the 5th to the 7th moderate weather was the rule, over the ocean as a whole. The American S. S. *President Roosevelt* reported a moderate SW. wind at the Greenwich mean noon observation on the 7th; this increased to gale force later in the day, as shown by following storm log:

Gale began on the 7th, wind SW. Lowest barometer 29.55 inches at 8 p. m. on the 7th, wind SW., 10, in latitude 47° 47′ N., longitude 36° 28′ W. End at 1 a. m. on the 8th. Highest force of wind 10; shifts SW.–N.

From the evening of the 7th until the 9th moderate northeasterly gales, accompanied by comparatively high pressure, were reported from a limited area east of Charleston. Storm log:

American S. S. *Sabine Sun:*

Gale began on the 7th, wind NE. Lowest barometer 30.10 inches at 7:30 p. m. on the 7th, in latitude 32° 11′ N., longitude 78° W. End at 11:30 p. m. on the 8th, wind NE. Highest force of wind 8; steady NE.

On the 8th there was a well developed depression central near latitude 55° N., longitude 27° W.; this moved swiftly eastward and on the 9th the center was near Lerwick, Shetland Islands, where a barometric reading of 28.48 inches was recorded. Storm log:

British S. S. *Turcoman:*

Gale began on the 8th, wind NW. Lowest barometer 28.91 inches, wind NW., 5, in latitude 56° 16′ N., longitude 27° 50′ W. End on the 9th, wind W. Highest force of wind 9; shifts WNW.–NW.–W.

From the 9th to the 12th low pressure prevailed in the Caribbean Sea and vessels in the Gulf of Mexico experienced northeasterly to easterly gales. Storm log:

American S. S. *Oswego:*

Gale began on the 8th, wind NE. Lowest barometer 29.84 inches at 4 p. m. on the 9th, wind NE., in latitude 28° 23′ N., longitude 93° 27′ W. End on the 13th, wind ENE. Highest force of wind 7; shifts NE.–E.

On the 9th a LOW appeared near latitude 36° longitude 50°; this drifted slowly northward, gradually filling in, and had practically disappeared by the 12th. Storm log:

American S. S. *Nile:*

Gale began on the 9th, wind SSW. Lowest barometer 29.59 inches at 4 p. m. on the 9th, wind variable, 3, in latitude 36° 21′ N., longitude 51° 11′ W. End on the 9th, wind NNE. Highest force of wind 9, NNE.; shifts WSW.–W.–WSW.

From the 10th to 16th low pressure continued in the North Sea, although no storm reports were received from vessels in these waters.

On the 13th there was a disturbance central near latitude 45°, longitude 37°, that during the next 24 hours moved rapidly southeastward, and on the 14th was central near the Azores, where it remained practically stationary until the 17th; it then curved toward the northeast, and on the 19th and 20th was over the British Isles. Storm logs:

British S. S. *Alexandrian:*

Gale began on the 13th, wind NW. Lowest barometer 29.16 inches at 11.30 a. m. on the 13th, wind NW., in latitude 45° 40′ N., longitude 43° 25′ W. End on the 14th, wind NE. Highest force of wind 9, N.; shifts NW.–N.

British S. S. *San Leopoldo:*

Gale began on the 14th, wind ESE., 7. Lowest barometer 29.48 inches at 4 a. m. on the 15th, wind E., in latitude 43° 40′ N., longitude 23° 37′ W. End on the 17th, wind N., 6. Highest force of wind 10; shifts ESE.–E.

Danish S. S. *Alexandria:*

Gale began on the 19th, wind NW. Lowest barometer 28.86 inches at 11 a. m. on the 19th, wind NW., 8, in latitude 58° 35′ N., longitude 14° 47′ W. End on the 21st, wind SSE. Highest force of wind 11; shifts NW.–SSE.

From the 15th to 19th winds of gale force were again encountered in the Gulf of Mexico, due to a tropical disturbance that will be described elsewhere in the REVIEW. Storm logs:

American S. S. *Corning:*

Gale began on the 15th, wind E., 7. Lowest barometer 29.14 inches at 7 p. m. on the 15th, wind ESE., 10, in latitude 27° 45′ N., longitude 91° 15′ W. End on the 16th, wind SW. Highest force of wind 11; shifts E.–ESE.–SE.–SW.

British S. S. *Mitra:*

Gale began on the 16th, wind SE. Lowest barometer 29.68 inches at 3 a. m. on the 16th, wind SE., 7, in latitude 27° 10′ N., longitude 88° 20′ W. End on the 17th, wind SE. Highest force of wind SE., 8; shifts SE.–SSW.

American S. S. *Muskogee:*

Gale began on the 15th, wind ESE. Lowest barometer 29.56 inches on the 17th, wind S., in latitude 27° N., longitude 91° 08′ W. End on the 19th, wind NNW. Highest force of wind 9, NNW.; shifts S.–SSW.

On the 17th the Japanese S. S. *Hayo Maru* encountered heavy southwesterly winds near Jamaica, although the vessel was too far from the center of the LOW to experience any rapid shift of wind, as shown by following storm log:

Gale began on the 17th, lowest barometer 29.75 inches at 4 a. m. on the 17th, wind SW., 6, in latitude 12° 51′ N., longitude 78° 15′ W. End at 4 p. m. on the 17th. Highest force of wind 8, WSW., between WSW.–SSW.

On the 16th still another disturbance of tropical origin was central near latitude 27°, longitude 60°; this moved northward, passing east of Bermuda, and on the 19th was apparently near Portland, Me. Storm logs:

American S. S. *Frank A. Morey:*

Gale began on the 16th, wind S. Lowest barometer, 29.50 inches at 4 p. m. on the 16th, wind SSW., in latitude 28° 30′ N., longitude 59° 40′ W. End on the 17th, wind SW. Highest force of wind 9, SSW.; shifts S.–SW.

American S. S. *Wildwood:*

Gale began on the 17th, wind SSE. Lowest barometer 29.79 inches at 4 p. m. on the 17th, wind SSE., in latitude 31° 38′ N., longitude 57° 14′ W. End at 5 p. m. on the 17th, wind SW. Highest force of wind 9, SE.; shifts SSE.–SSW.

American S. S. *Santa Isabel:*

Gale began on the 18th, wind NE. Lowest barometer 29.15 inches at 8 p. m. on the 18th, wind NE., 10, in latitude 40° 10′ N., longitude 69° 38′ W. End at 11:35 p. m. on the 18th, wind SW. Highest force of wind 10, SSE.; shifts NE–SE–S–SW–W.

Charts X to XV show the conditions from the 22d to the 27th, inclusive, when from the 22d to 24th a tropical disturbance invaded the Atlantic coast of the United States, the storm area extending as far north as Nantucket on the latter date, while from the 23d to 27th the eastern section of the ocean was swept by violent gales. Storm logs:

American S. S. *D. G. Scofield:*

Gale began at 4 p. m. on the 21st, wind NNE. Lowest barometer 29.70 inches at 2 p. m. on the 23d, wind NE., 8, in latitude 38° 30′ N., longitude 73° 50′ W. End at 6 p. m. on the 23d, wind NE. Highest force of wind 11, NE.; wind from NNE.–NE.

American S. S. *Sinsinawa:*

Gale began on the 22d, wind NE. Lowest barometer 29.75 inches at midnight on the 22d, wind NE., in latitude 39° 18′ N., longitude 72° 20′ W. End on the 23d, wind NE. Highest force of wind 9, NE.; steady NE.

American S. S. *Miller County:*

Gale began on the 23d, wind NE. Lowest barometer 29.77 inches at 5 a. m. on the 23d, wind NE., 9, in latitude 38° 48′ N., longitude 75° 01′ W. End on the 24th, wind NE., 7. Highest force of wind 10, NE.; steady NE.

American S. S. *Minnequa:*

Gale began on the 23d, wind NW. Lowest barometer 29.46 inches at 3 p. m. on the 23d, wind NW., in latitude 49° 30′ N., longitude 28° W. End on the 28th, wind NW. Highest force of wind 10, NW.; shifts not given.

American S. S. *Balsam:*

Gale began on the 23d, wind NW. Lowest barometer 28.68 inches at 10 p. m. on the 26th, wind NW., 10, in latitude 51° N., longitude 19° W. End on the 27th, wind NW. Highest force of wind 10, NW.; shifts NW.–NE.–NW.

British S. S. *Camito:*

Gale began on the 26th, wind WSW. Lowest barometer 29.63 inches on the 26th, wind NNW., 9, in latitude 40° 40′ N., longitude 25° 20′ W. End on the 27th, wind N. Highest force of wind, 9, NNW.; shifts NW.–N.–NNE.

British S. S. *Devonian:*

Gale began on the 26th, wind S. Lowest barometer 28.56 inches on the 26th, wind S., 7, in latitude 51° 32′ N., longitude 18° 07′ W. End on the 29th, wind NW. Highest force of wind 10; shifts SSW.–NNW (12 points). On the 27th wind backed to S., 8, after blowing hard from NW., 10. Remarkable fluctuation of the barometer was noticed.

American S. S. *West Celina:*

Gale began on the 26th, wind WSW. Lowest barometer 28.51 inches at 9 a. m. on the 27th, wind SSW., 6, in latitude 51° 15′ N., longitude 4° W. End on the 28th. Highest force of wind 9; shifts SSW.–W.

On the 27th there was a well defined LOW central near latitude 46° N., longitude 48° W.; this moved rapidly northeastward and on the 31st was in the vicinity of Ireland.

On the 28th and 29th a large storm area covered the central part of the ocean and a few reports were received denoting moderate gales on the 28th near the 10th meridian, west longitude, between the 35th and 50th parallels.

On the 30th the stormy weather was confined to the region between the 48th and 58th parallels and the 15th and 27th meridians.

On the 31st although there was no well-developed disturbance, several vessels in widely scattered localities reported gales. Storm logs:

British S. S. *Ariano:*

Gale began on the 28th, wind N. Lowest barometer 28.65 inches at 2 p. m. on the 28th, wind N., 8, in latitude 53° 20′ N., longitude 43° 14′ W. End on the 29th, wind NNW. Highest force of wind 9; steady N.

American S. S. *Docket:*

Gale began on the 28th, wind SW., 5. Lowest barometer 29.90 inches at 8 a. m. on the 28th, wind SW., 8, in latitude 35° N., longitude 40° W. End at 8 p. m. on the 28th, wind N. Highest force of wind 8; shifts SW.–N.

British S. S. *Caledonian:*

Gale began on the 28th, wind SW. Lowest barometer 28.75 inches at 7 a. m. on the 29th, wind WSW., 7, in latitude 54° 16′ N., longitude 27° 15′ W. End on the 30th, wind W. Highest force of wind 9; shifts SW.–WSW.–W.

British S. S. *Galtymore:*

Gale began on the 29th, wind SSW. Lowest barometer 28.59 inches at 4 a. m. on the 30th, wind SW., 8, in latitude 58° 20′ N., longitude 17° 30′ W. End on the 31st, wind W. Highest force of wind 10; shifts SW.–W.

On the 31st the American S. S. *Montgomery City* encountered a northeasterly gale near the Azores. Storm log:

Gale began on the 31st, wind ENE. Lowest barometer 29.66 inches at 6 a. m. on the 31st, wind ENE., in latitude 36° 31′ N., longitude 28° 08′ W. End on November 1, wind NNE., 8. Highest force of wind 8, NNE.; shifts WNW.–ENE.

On the 31st at Greenwich mean noon, the American S. S. *Coelleda* reported a moderate SSW. wind that afterwards developed into a gale as shown by following storm log:

Gale began on the 31st, wind SSW. Lowest barometer 30.05 inches at 8 a. m. on the 31st, wind SSW., 7, in latitude 40° 35′ N., longitude 63° 30′ W. End on November 2, wind SSW. to N. Highest force of wind 10, SSW.; shifts SSW.–WNW.

NORTH PACIFIC OCEAN.

By WILLIS E. HURD.

Rough weather set in unmistakably over the northern portion of the North Pacific Ocean during October, following the premonitory gales that swept these waters during the last decade of September. Throughout the month the Aleutian LOW surged backward and forward with intense energy along the 55th parallel, its centers of action being generally well developed to the eastward or to the westward of the Alaskan Peninsula. In the Gulf of Alaska especially, and to the southward, terrific bursts of weather occurred on several dates, and shipping was buffeted about by strong gales to hurricane winds and mountainous seas. In the Far East tropical storm conditions occurred, and full hurricane winds were encountered on the 10th and 11th by vessels to the southward and eastward of Japan.

The North Pacific HIGH was generally well developed during the month, and no depressions seem to have developed in low latitudes within the extent of its usual area, although low pressure on several days, more particularly on the 11th, extended far southward from the Aleutian center.

The barometric distribution over the eastern part of the ocean was thus characterized by extraordinarily low pressure in the vicinity of the Aleutians and by high pressure in the near-by region of Midway Island. The average pressure at Dutch Harbor, which may be taken to represent the Aleutian region, was 29.29 inches (p. m. observations), or 0.41 inch below the normal. So far as available records show, this is the lowest pressure that has been recorded at Dutch Harbor in the month of October. Previous low values, in a record more or less fragmentary prior to 1916, are as follows: 1922, 29.48 inches; 1914, 29.56 inches; 1885, 29.41 inches. Readings recorded at the p. m. observation show that the barometer rose to